BEFORE

THE PUBLIC SERVICE COMMISSION OF

SOUTH CAROLINA

DOCKET NO. 92-004-E - ORDER NO. 92-830

SEPTEMBER 28, 1992

IN RE: Adjustment of Base Rates for Fuel Costs for Carolina Power & Light Company.	)))	ORDER APPROVING BASE RATES FOR FUEL COSTS

This matter is before the Public Service Commission of South Carolina (the Commission) on the review of the cost of fuel used in electric generation by Carolina Power & Light Company (CP&L or the Company) to provide service to its South Carolina retail electric customers. The procedure followed by the Commission, as set forth in S.C. Code Ann. §58-27-865 (Supp. 1991), provides for a six month review of an electric utility's fuel costs. The review in this case is from April 1992 through September 1992.[1]

At the hearing on September 15, 1992, William F. Austin, Esquire, and Len S. Anthony, Esquire, represented the Company; Nancy V. Coombs, Esquire, represented Intervenor the Consumer Advocate for the State of South Carolina (the Consumer Advocate);

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1. By Order No. 92-215, Docket No. 92-003-E (March 31, 1992), the Commission deferred consideration of the refueling outage at Brunswick Unit 2 which began on September 11, 1991. This unit had not returned to service by the conclusion of the period under review in Docket No. 92-003-E. Consequently, this refueling outage is being addressed in this proceeding. The Commission is not, however, considering the prudency of the outages at Brunswick Units 1 and 2 which began on April 21, 1992, because these units have not returned to service. See Commission Directive dated July 21, 1992.

Francis P. Mood, Esquire, represented Intervenor Nucor Steel, a Division of Nucor Corporation; and Gayle B. Nichols, Staff Counsel, represented the Commission Staff (Staff). The record before the Commission consists of the testimony of three witnesses on behalf of the Company, three witnesses on behalf of the Commission Staff (Staff), and 9 exhibits.[2]

Based upon a thorough consideration of the evidence in the record and the applicable law, the Commission makes the following findings of fact and conclusions of law.

FINDINGS OF FACT

1. The record of this proceeding indicates that for the period from January 1992 through June 1992, the Company's actual total fuel costs for its electric operations amounted to $280,171,891.[3] Hearing Exhibit 7, p. 19. This figure was uncontroverted.

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2. Upon agreement of the parties, CP&L did not present witnesses Larry L. Yarger and David R. Nevil and the Staff did not present witness Jacqueline R. Cherry. The pre-filed testimony of these three witnesses was, however, placed in the record and their exhibits were admitted as Hearing Exhibits 2, 1, and 7, respectively.

3. Because information concerning outages during the period under review is not available until approximately two months after the hearing, the Commission usually considers the actual data from the two months prior to the period under review and the following four months. However, in order to facilitate discovery, in this proceeding, the parties agreed to consider actual data from January 1, 1992 through June 30, 1992 and estimated data for the months of July through September 1992.

2. Staff witness A. R. Watts reviewed and compiled a percentage generation mix statistical sheet for the Company's fossil, nuclear, and hydroelectric plants for January 1992 through June 1992. The fossil generation ranged from a high of 78% during the months of May and June 1992 to a low of 42% in January 1992. The nuclear generation ranged from a high of 56% in January 1992 to a low of 19% during the months of May and June 1992. The percentage of generation by hydro ranged from 2% to 3% for this period. Hearing Exhibit 9, p. 12.

3. According to Company witness Roland M. Parsons, CP&L's larger fossil units, Roxboro Units 2, 3, and 4 and Mayo Unit 1, operated at equivalent availabilities of 92.5%, 55.0%, 96.3%, and 75.9%, respectively. He testified that CP&L's fossil steam system achieved an equivalent availability of 85.0%. Mr. Parsons explained that the most recently published North American Electric Reliability Council (NERC) average equivalent availability for coal fired plants was 81.14%. Staff witness A.R. Watts considered the fossil unit outage report submitted by the Company and found no problem areas.

4. Witness Parsons testified that the Company's nuclear system operated at a capacity factor of over 62.3% for the period January through June 1992 and provided in excess of 8.3 billion kilowatt-hours of generation. This represented approximately 43.1% of the Company's generation for this period. During the period, Brunswick Unit 1 achieved a capacity factor of 55.6%, Brunswick Unit 2 achieved a capacity factor of 39.5%, Harris Unit 1 achieved

a capacity factor of 95.8%, and Robinson Unit 2 achieved a capacity factor of 52.7%.

5. During the period from January 1992 through June 1992 coal suppliers delivered 3,720,569.54 tons of coal at an average received cost per ton of $44.83. The audit of the Company's actual fuel procurement activities by Staff witness Jacqueline Cherry demonstrated that the average monthly received cost per ton varied from $46.05 in February 1992 to $43.49 in April 1992. Hearing Exhibit 7, p. 14.

6. Company witness Larry L. Yarger testified that the Company's fuel procurement practices and procedures were reasonable. The Staff conducted an extensive review and audit of the Company's fuel purchasing practices and procedures for the subject period. Staff witness Cherry testified that the Company's fuel costs were supported by the Company's books and records.

7. The record of this proceeding indicates that a comparison of the Company's fuel revenues and expenses for the period January 1992 through June 1992 produces an over-recovery of $536,223. After taking into consideration a projected under-recovery of $5,495,485 for the months of July through September 1992, the Company's cumulative under-recovery is $4,959,262.

8. The Company projected that its fuel costs and system sales for October 1992 through March 1993 would yield an average cost per kilowatt-hour of 1.463 cents. Adding to this the expected under-recovery as of the end of September 1992, and divided by the projected South Carolina retail kilowatt-hour sales from October

1992 through March 1993 produces a base fuel component of 1.659 cents. Company witness David R. Nevil testified that he recommended the Commission set the fuel factor at 1.450 cents for the period October 1, 1992 through March 1993. According to Mr. Nevil's exhibits, CP&L projects to under-recover $5,551,625 at March 31, 1993 if the fuel factor is set at 1.450 cents. Hearing Exhibit 1, p. 5.

9. Staff witness A. R. Watts testified the fuel factor should remain at 1.375 cents per kilowatt hour.[4] Mr. Watts testified that, based on projections, a 1.375 cent fuel factor will result in a $7,348,569 under-recovery at the end of March 1993. Nonetheless, Mr. Watts explained that for the past three fuel proceedings CP&L has overestimated its projected fuel costs and, therefore, has over-recovered between $1.4 and $5 million. Accordingly, Mr. Watts testified that the expected magnitude of CP&L's projected underrecovery was uncertain. Moreover, Mr. Watts explained that because of the Commission's instructions to defer consideration of the on-going nuclear outages at CP&L's Brunswick Units and because of the uncertainty of these units' on-line dates, it would be appropriate to continue the factor of 1.375 cents per kilowatt hour. Mr. Watts testified that his recommendation was in keeping with the fuel statute's admonition to allow utilities to recover prudently incurred fuel cost "in a manner that tends to

4. For the periods of October 1991 through March 1992 and April 1992 through September 1992, the Commission set the fuel factor at 1.375 cents per kilowatt-hour.

assure public confidence and minimize abrupt changes in charges to customers." Watts, Pre-filed testimony, p. 3-4.

10. During the period under review, CP&L had eight (8) scheduled and/or forced outages, excluding both Brunswick Unit outages commencing April 21, 1992, at its four nuclear plants. The Commission Staff recommended that the Commission disallow the recovery of fuel costs for thirteen (13) days due to unreasonable actions of the Company during the Brunswick Unit 2 refueling outage which began on September 11, 1991, and eight (8) hours due to unreasonable actions of the Company during the Robinson Unit 2 refueling outage which began on March 27, 1992. The Company asserted that while personnel errors extended both of these outages, CP&L took reasonable steps to safeguard against these errors and, therefore, the Commission should not disallow the fuel costs associated with these outages. The facts of these outages are not in dispute.

11. Brunswick Unit 2 Outage - September 11, 1991 through January 5, 1992.

On September 11, 1991, Brunswick Unit 2 began a planned outage for refueling, maintenance, and modification. The outage had a scheduled duration of 91 days with a critical path of 77 days. The actual outage duration was 25 days longer than the scheduled duration of 91 days. Thirteen (13) days of the 25-day extension was due to damage to the #3 bearing between the High Pressure and Low Pressure turbine. This "bearing damage resulted because tilt and twist adjustments were not performed after the "A" coupling was

reassembled as specified by the vendor. As a result, the induced bearing misalignment was not detected." Hearing Exhibit 4, p. 3. Mr. Parsons explained that a contributing cause to this event "was the need to resequence turbine work during the outage." Parsons, Pre-filed testimony, p. 12.

Mr. Parsons testified that CP&L had assigned an experienced turbine project manager to the turbine activities, had shift specialists reporting to the turbine manager, and that the shift specialists were supported by vendor technical representatives. In addition, Mr. Parsons explained that the actual turbine work was performed by traveling CP&L mechanics who specialized in turbine overhauls. Mr. Parsons stated that for each shift, the shift specialist produced "plan of the day" directions which the crew followed.

Commission Staff witness Walsh testified this outage was extended for thirteen (13) days due to unreasonable actions on the part of CP&L. Mr. Walsh testified the first cause of this outage was CP&L's failure to realign bearing #3 before reassembling the "A" coupling. Mr. Walsh testified the second cause of the outage was CP&L's failure to have sufficient supervisory control over the turbine activities.

In its own critical self-analysis of the event, CP&L recognized "[t]here were no plant personnel assigned to the turbine project management team other than the project manager. The resulting need for his [the project manager] frequent direct involvement with interface issues interfered with his overview role

to ensure proper job planning and job direction." Hearing Exhibit 4, p. 5. CP&L noted that "[t]here were no 'activity lists' to ensure the critical alignment checks for bearing #3 were performed, documented, and reviewed in the right sequence with reassembly of the "A" coupling." Hearing Exhibit 4, p. 5. In addition, CP&L recognized as follows:

> The format of the existing maintenance instructions is not able to provide the controls and flexibility needed for this type of job due to the number of parallel activities, the ongoing and unanticipatable changes in the workscope and job sequence during an outage, and the continuing changes in workscope from refueling outage to outage.

In Inspection Report Nos. 50-325/91-39 and 50-324/91-39, the Nuclear Regulatory Commission (NRC) stated that, although the turbine crew was comprised of experienced individuals, there did not appear to be a specific project manager who was not actively involved in the actual work and that "[t]he lack of an overall project manager to control and track the sequence of work and ensure that all critical activities were completed before the turbine was rolled may have been a contributing factor in this event." Hearing Exhibit 5, p. 6. The NRC further stated that "[t]he use of a scheduling flow chart to track activities instead of specific sign off or formalized procedures may have led to this occurrence." Hearing Exhibit 5, p. 6.

12. Robinson Unit 2 Outage - March 27, 1992 through June 24, 1992.

On March 27, 1992, Robinson Unit 2 began a planned outage for refueling, maintenance, and modification. The outage had a scheduled duration of 84 days, including a contingency. The actual outage duration was 4 days longer than the scheduled duration.

Commission Staff witness A. R. Watts testified that the outage was extended for eight (8) hours as a result of unreasonable actions by the Company. Mr. Watts testified that on May 14, 1992, a technician, intending to install jumpers to bypass interlocks in order to open two valves, failed to correctly follow the instructions on two work requests and placed the jumpers on incorrect terminals. Mr. Watts explained that this error resulted in damage to the motor which operated one of the valves and that replacement of the motor resulted in an eight (8) hour delay in bringing the unit back to service. Mr. Watts referred to CP&L's Adverse Condition Report No. 92-148 and Executive Summary for detailed explanation of the error.

On cross-examination, Mr. Parsons testified that, while unfamiliar with the particular auxiliary panels on which the work activity was to be performed, the technician who improperly installed the jumpers had 7½ years experience working on electrical devices in the plant and was familiar with installing jumpers and reading control wiring diagrams. Mr. Parsons explained that the technician had been given the control wiring diagram for the auxiliary panels and had received verbal instructions prior to

performing the activity. Mr. Parsons admitted that CP&L's Executive Summary stated that the control wiring diagrams for the valves' auxiliary panels show the auxiliary panels in a broken block diagram and that terminals from other auxiliary panels shown within the same broken lines are only designated by a letter number to distinguish them from belonging to the panel. Mr. Parsons explained that CP&L is in the process of revising the control wiring diagram.

13. At the conclusion of the hearing, the Consumer Advocate urged that the Commission retain the current 1.375 cents per kilowatt-hour fuel factor.

CONCLUSIONS OF LAW

1. Pursuant to S. C. Code Ann.§58-27-865(A)(Supp. 1991), each electrical utility must submit to the Commission its estimated fuel costs for the next six months. Following investigation of these estimates and after a public hearing, the Commission directs each electrical utility "to place in effect in its base rate an amount designed to recover, during the succeeding six months, the fuel costs determined by the Commission to be appropriate for that period, adjusted for the over-recovery or under-recovery from the preceding six month period." Id.

2. South Carolina Code Ann.§58-27-865(F)(Supp. 1991) requires the Commission to allow electrical utilities to recover "all their prudently incurred fuels costs... in a manner that tends to assure public confidence and minimize abrupt changes in charges to consumers."

3. South Carolina Code Ann.§58-27-865(E)(Supp. 1991) specifies as follows:

> The Commission shall disallow recovery of any fuel costs that it finds without just cause to be the result of failure of the utility to make every reasonable effort to minimize fuels costs or any decision of the utility resulting in unreasonable fuel costs, giving due regard to reliability of service, economical generation mix, generating experience of comparable facilities, and minimization of the total cost of providing service.

4. As stated by the Supreme Court in Hamm v. South Carolina Public Service Commission, 291 S.C. 178, 352 S.E.2d 476, 478 (1987), Section 58-27-865(E) requires the Commission "to evaluate the conduct of the utility in making the decisions which resulted in the higher fuel costs. If the utility has acted unreasonably, and higher fuel costs are incurred as a result, the utility should not be permitted to pass along the higher fuel costs to its customers." "[T]he rule does not require the utility to show that its conduct was free from human error; rather it must show it took reasonable steps to safeguard against error." Id. at 478, citing Virginia Electric & Power Co. v. Division of Consumer Counsel, 220 Va. 930, 265 S.E.2d 697 (1980). By Order Nos. 91-636 (August 6, 1991) and 91-762 (September 6, 1991), this Commission specifically ruled that it would apply negligence principles to its determination of whether an electric utility's actions in regard to fuel costs were either reasonable or unreasonable.

5. The major advantage of producing electricity by nuclear power is the relatively low fuel cost for nuclear fueled generating facilities. The cost of generation of electricity is generally

composed of costs such as capital, interest, taxes, insurance, operating and maintenance (O&M) costs, and fuel costs. For fossil fueled plants, the cost of the fuel is a larger portion of the total cost to generate electricity. For nuclear power plants, while the capital and O&M costs are higher compared to fossil fueled plants, the fuel costs are comparatively low. Thus, if the electricity generated by a nuclear plant must be replaced by electricity from a coal or gas fired plant, the Company incurs higher fuel costs. This difference between the fuel cost to generate a quantity of electricity by fossil fuel and the fuel cost to generate the same quantity of electricity by nuclear fuel is the excess replacement fuel cost.

6. Brunswick Unit 2 Outage - September 11, 1991 through January 5, 1992.

The Commission concludes that ureasonable actions by CP&L extended this refueling outage by thirteen (13) days. The Commission finds that CP&L personnel unreasonably failed to follow vendor instructions which specified realignment of the #3 bearing after reassembly of the "A" coupling. In addition, the Commission finds that, although the turbine crew may have been comprised of experienced individuals, CP&L failed to provide the turbine overhaul team with an overall project manager who could track the succession of work, particularly because it was necessary to resequence the turbine work during the outages. Moreover, the Commission finds that the lack of activity lists to check off critical steps, such as bearing realignment, as completed may have

contributed to the outage. The Commission concludes that unreasonable actions of the Company extended this scheduled outage by thirteen (13) days and, consequently, the recovery of $319,435 in excess fuel costs associated with these thirteen (13) days should be disallowed.

7. Robinson Unit 2 - March 27, 1992 through June 24, 1992.

Based on the evidence of record, the Commission finds that unreasonable actions on the part of CP&L resulted in an eight (8) hour extension of this outage. The record is clear that a technician's failure to follow work order instructions led to the improper placement of the electrical jumpers and that this personnel error caused the extension of the refueling outage. Further, the evidence of record contradicts Mr. Parson's assertion that CP&L had no reason to believe that the technician was not properly prepared to perform the work. Parsons, Re-direct testimony. CP&L's own documentation states that the technician's supervisor was counselled "on having the right person on the right job." From this statement the Commission concludes that the supervisor did not select a qualified technician to perform the jumper task. Moreover, CP&L's Executive Summary suggests that the control wiring diagram may have contributed to the technician's error. Mr. Parsons testified that CP&L is in the process of revising the diagram. Based on this evidence, the Commission finds that the $8,897 excess fuel expenses associated with the eight (8) hour extension of this outage should be disallowed.

8. After considering the directives of Section 58-27-865(A)

and (F) which require it to place in effect a base fuel cost which allows the Company to recover its fuel costs for the next six months, adjusted for the over-recovery or under-recovery from the preceeding six month period, in a manner which assures public confidence and minimizes abrupt changes in charges, the Commission has determined that the appropriate base fuel factor for October 1992 through March 1993 is 1.375 cents per kilowatt-hour. Although it recognizes that, based upon projections, CP&L anticipates under-recovering $7,348,569 at the end of March 1993 if the fuel factor is set at 1.375 cents, the Commission notes that this projected under-recovery is less than two million dollars more than the under-recovery CP&L would expect if the fuel factor were set at CP&L's recommended amount of 1.450 cents per kilowatt-hour. Given the fact that CP&L's projections have ultimately resulted in over-recoveries between $1.4 million and $5 million for the past eighteen (18) months, the Commission concludes that a fuel factor of 1.375 cents per kilowatt-hour is appropriate. Moreover, continuation of the current fuel factor will prevent any changes in customer charges for fuel and assure public confidence, as required by the statute.

IT IS THEREFORE ORDERED THAT:

1. The base fuel factor for the period October 1992 through March 1993 is set at 1.375 cents per kilowatt-hour.

2. Within ten (10) days of the date of this Order, CP&L shall file with the Commission rate schedules designed to incorporate the findings herein and an adjustment for fuel costs as

demonstrated by Appendix A.

3. The allowable fuel expense for the period April 1992 through September 1992 shall be reduced by $328,332[5] because of the unreasonable actions of the Company as explained in this Order.

4. CP&L shall fully respond to discovery from all parties and from the Commission Staff in an open and expeditious manner in all proceedings before this Commission.

BY ORDER OF THE COMMISSION:

Chairman

ATTEST:

Executive Director

(SEAL)

5. This figure is based on the Company's revised MDCs, which results in a positive adjustment to the South Carolina Retail Cumulative Recovery Account. The adjustment is a calculation of the length of the disallowed outages, multiplied by a capacity factor of 85% for Brunswick and 80% for Robinson, adjusted for Power Agency Ownership, where applicable, and multiplied by the cost difference between nuclear fuel, when available, at the unit where the outage occurred (when not available, Staff used the nuclear fuel cost for the closest month which was indicative of actual fuel expense) and average fossil fuel for the month of the outage. Thereafter, the South Carolina retail energy allocation factor was applied.

CAROLINA POWER & LIGHT COMPANY
Adjustment for Fuel Costs

APPLICABILITY

This adjustment is applicable to and is a part of the Utility's South Carolina retail electric rate schedules.

The Public Service Commission has determined that the costs of fuel in an amount to the nearest one-thousandth of a cent, as determined by the following formula, will be included in the base rates to the extent determined reasonable and proper by the Commission for the succeeding six months or shorter period:

$$F = \frac{E}{S} + \frac{G}{S_1}$$

Where:

F= Fuel cost per Kilowatt-Hour included in base rate, rounded to the nearest one-thousandth of a cent.

E= Total projected system fuel costs:

(A) Fuel consumed in the Utility's own plants and the Utility's share of fuel consumed in jointly owned or leased plants. The cost of fossil fuel shall include no items other than those listed in Account 151 of the Commission's Uniform System of Accounts for Public Utilities and Licensees. The cost of nuclear fuel shall be that as shown in Account 518 excluding rental payments on leased nuclear fuel and except that, if Account 518 also contains any expense for fossil fuel which has already been included in the cost of fossil fuel, it shall be deducted from this account.

PLUS

(B) Purchased power fuel costs such as those incurred in unit power and Limited Term power purchases where the fuel costs associated with energy purchased are identifiable and are identified in the billing statement.

PLUS

(C) Interchange power fuel costs such as Short Term, Economy, and other where the energy is purchased on economic dispatch basis.

Energy receipts that do not involve money payments such as Diversity energy and payback of storage energy are not defined as purchased or interchange power relative to this fuel calculation.

MINUS

(D) The cost of fuel recovered through intersystem sales including the fuel costs related to economy energy sales and other energy sold on an economic dispatch basis.

Energy deliveries that do not involve billing transactions such as Diversity energy and payback of storage are not defined as sales relative to this fuel calculation.

S = Projected system kilowatt-hour sales excluding any intersystem sales.

G = Cumulative difference between jurisdictional fuel revenues billed and fuel expenses at the end of the month preceding the projected period utilized in E and S.

S_1 = Projected jurisdictional kilowatt-hour sales for the period covered by the fuel costs included in E.

The appropriate revenue related tax factor is to be included in these calculations.

The fuel cost (F) as determined by Public Service Commission of South Carolina Order No. 92-830 for the period October 1992 through March 1993 is 1.375 cents per kilowatt-hour.